

### **ABSTRACT OF THE DISCLOSURE**

A Raman amplifier for amplifying WDM radiation propagating along an optical fiber, the WDM radiation comprising a plurality of radiation components each having a selected waveband, comprises a plurality of optical radiation generators operable to generate pump radiation of a selected wavelength and power, the radiation being coupled into the fiber to optically amplify the WDM radiation. The generators are wavelength tuneable, and the power of the radiation components of the WDM radiation is measured after it has propagated along the fiber and has been amplified. The wavelength and power of operation of the generators are controlled in dependence upon the measured powers such as to make the measured powers substantially equal in magnitude and of a selected magnitude. To reduce polarization dependent gain where the pump radiation propagates in a direction along the optical fiber that is counter to the direction of propagation of the WDM radiation, each generator preferably comprises a plurality of radiation sources, preferably three, each one being operable to generate radiation having the same wavelength but with a different state of polarization. Advantageously, the three radiation sources are operable to generate radiation whose state of polarization is shifted by  $60^\circ$  to each other and which are combined using a polarization maintaining multiplexer.